

Hanii Takahashi

JIFRESSE Assistant Researcher
Jet Propulsion Laboratory - California Institute of Technology
233-305F, 4800 Oak Grove Drive,
Pasadena, CA 91109, United States
hatakaha@ucla.edu or hanii.takahashi@jpl.nasa.gov
Phone: (818)-393-7414

EDUCATION:

Aug 2009 – June 2013: Ph.D., Earth and Environmental Science, City University of New York
Aug 2007 – May 2009: M.S., Pure Mathematics, New York University, Courant Institute, New York
Aug 2005 – May 2007: B.S., Pure Mathematics, Purdue University, Indianapolis, Indiana
Apr 2000 – Mar 2004: B.S., Physics, Chuo University, Tokyo, Japan

EMPLOYMENT:

August 2016 – Present: JIFRESSE Assistant Researcher, NASA Jet Propulsion Laboratory – University of California, California

- I am a PI of CCST proposal and have been involving a GEWEX-PROES project called UT-PROES, which is a processes evaluation study on transport pathways (vertical and horizontal), internal vertical structure, level of outflows, and magnitude of convective dilution/entrainment over continental and oceanic deep convective systems.
- I am a leading scientist of a GEWEX-PROES project called PROES-WR, which is a processes evaluation study on warm rain in GCMs and CRMs.
- I have developed a convection tracking method based on the IMERG precipitation product.

July 2013 – July 2016: Postdoctoral Scholar, NASA Jet Propulsion Laboratory - California Institute of Technology, California

- I have developed metrics to characterize internal vertical structures of tropical deep convection
- I have studied the warm rain formation process based on CloudSat, Moderate Resolution Imaging Spectroradiometer (MODIS), and model simulations.
- I have analyzed the upper tropospheric water vapor errors in CMIP5 using MLS, AIRS, and reanalysis data.
- I also have investigated dynamic and thermodynamic controls of water vapor errors and water vapor changes under global warming.

Aug 2009 – June 2013: Research Assistant, City College of New York

- I introduced the new methodology to estimate level of neutral buoyancy (LNB) directly from CloudSat dataset instead of using parcel theory based on sounding data.
- To combine polar-orbiting satellite (CloudSat) with gestational satellite (ISCCP), I studied the occurrence frequency of overshooting convection (OSC), differences in OSC embedded in three convective stages (i.e., growing, mature, and dissipating stages), and regional and diurnal variations of OSC properties.

Aug 2010 – June 2013: Teaching Assistant, City College of New York

- EAS 311/B9014: Fundamentals of Atmospheric Science
- EAS 488/B8800: Climate & Climate Change
- EAS 417/B9025: Satellite Meteorology
- EAS426/Engr301: Introduction to Remote Sensing/Image Analysis

INTERNSHIP:

NASA Jet Propulsion Laboratory, Microwave Atmospheric Science Group, California, May 2012 – Aug 2012

- The water vapor measurements from the Aura Microwave Limb Sounder and Aqua Atmospheric Infrared Sounder are analyzed to study the variations of water vapor during the 2006-7 and 2009-10 El Niños.
- Regression of water vapor anomalies onto the Niño-3.4 SST for the A-Train period is conducted.
- GFDL model simulations of water vapor and clouds were studied and compared with the satellite observations.

United Nations Headquarters, DESA, Population Estimates and Projection Section, New York, Sep 2008 – Dec 2008

- Adult mortality estimates in Central Asian countries of former USSR
- Producing population projections and estimates by demographic, statistical and computer science expertise

TEACHING:

EAS10400: Climate Change and Global Warming (lab), City College of New York

SCI200: Scientific Computing, Measurements and Modeling, City College of New York

SELECTED AWARDS: JPL 2015 Postdoc Day Best Poster

PUBLICATIONS:

I. PEER-REVIEWED ARTICLES:

1. **Takahashi, H.**, A., Bodas-Salcedo., and Stephens, G.L (2021): Warm Cloud Evolution, Precipitation, and Their Weak Linkage in HadGEM3: New Process-Level Diagnostics using A-Train Observations, In review at JAS.
2. **Takahashi, H.**, M. Lebsock, Z. J. Luo, H. Masunaga, and C. Wang (2021): Detection and tracking of tropical convective storms based on globally gridded precipitation measurements: Algorithm and low latitude survey, *J. Appl. Meteor. Climatol.*, <https://doi.org/10.1175/JAMC-D-20-0171.1>
3. **Takahashi, H.**, Z. J. Luo, and G. L. Stephens (2021): Revisiting the entrainment relationship of convective plumes: A perspective from global observations, *Geophys. Res. Lett.*, <https://doi.org/10.1029/2020GL092349>
4. Stephens, G.L., Christensen, M., Andrews, T., Haywood, J., Malavelle, F.F., Suzuki, K., Jing, X., Lebsock, M., Li, J.L.F., **Takahashi, H.** and Sy, O (2019), Cloud Physics from Space. *Quarterly Journal of the Royal Meteorological Society*, 1–22. <https://doi.org/10.1002/qj.3589>
5. **Takahashi, H.**, M., Lebsock, K., M., Richardson., R., Marchand., J Kay (2019), When Will Spaceborne Cloud Rader Detect Upward Shifts in Cloud Heights? *Journal of Geophysical Research: Atmospheres*, 124. <https://doi.org/10.1029/2018JD030242>
6. Kahn, B. H., **Takahashi, H.**, Stephens, G. L., Yue, Q., Delanoë, J., Manipon, G., ... & Heymsfield, A. J. (2018). Ice cloud microphysical trends observed by the Atmospheric Infrared Sounder. *Atmospheric Chemistry and Physics*, 18(14), 10715-10739. <https://doi.org/10.5194/acp-18-10715-2018>
7. **Takahashi, H.**, M., Lebsock, K., Suzuki, G., Stephens, and M., Wang (2017), An Investigation of Microphysics and Sub-grid Scale Variability in Warm Rain Clouds using The A-Train Observations and A Multi-Scale Modeling Framework, *J. Geophys. Res. Atmos.*, 122. <https://doi.org/10.1002/2016JD026404>
8. Luo, Z. J., Anderson, R. C., Rossow, W. B., & **Takahashi, H.** (2017). Tropical Cloud and Precipitation Regimes As Seen from Near-Simultaneous TRMM, CloudSat, and CALIPSO Observations and Comparison with ISCCP. *Journal of Geophysical Research: Atmospheres*, 122(11), 5988-6003. <https://doi.org/10.1002/2017JD026569>
9. Malavelle, F., Haywood, J., Jones, A., Gettelman, A., Clarisse, L., Bauduin, S., Allan, R., Karset, I., Kristjánsson, J., Oreopoulos, L., Cho, N., Lee, D., Bellouin, N., Boucher, O., Grosvenor, D., Carslaw, K., Dhomse, S., Mann, G., Schmidt, A., Coe, H., Hartley, M., Dalvi, M., Hill, A., Johnson, B., Johnson, C., Knight, J., O'Connor, F., Partridge, D., Stier, P., Myhre, G., Platnick, S., Stephens, G., **Takahashi, H.**, & Thordarson, T. (2017). Strong constraints on aerosol-cloud interactions from volcanic eruptions. *Nature*, 546, 485-491, <https://doi.org/10.1038/nature22974>
10. **Takahashi, H.**, Suzuki, K., & Stephens, G. (2017). Land–ocean differences in the warm-rain formation process in satellite and ground-based observations and model simulations. *Quarterly Journal of the Royal Meteorological Society*, 143(705), 1804-1815. <https://doi.org/10.1002/qj.3042>
11. **Takahashi, H.**, Luo, Z. J., & Stephens, G. L. (2017). Level of neutral buoyancy, deep convective outflow, and convective core: New perspectives based on 5 years of CloudSat data. *Journal of Geophysical Research: Atmospheres*, 122(5), 2958-2969. <https://doi.org/10.1002/2016JD025969>
12. **Takahashi, H.**, Su, H., & Jiang, J. H. (2016). Water vapor changes under global warming and the linkage to present-day interannual variabilities in CMIP5 models. *Climate Dynamics*, 47(12), 3673-3691. <https://doi.org/10.1007/s00382-016-3035-5>
13. **Takahashi, H.**, Su, H., & Jiang, J. H. (2016). Error analysis of upper tropospheric water vapor in CMIP5 models using “A-Train” satellite observations and reanalysis data. *Climate Dynamics*, 46(9-10), 2787-2803. <https://doi.org/10.1007/s00382-015-2732-9>
14. **Takahashi, H.**, & Luo, Z. J. (2014). Characterizing tropical overshooting deep convection from joint analysis of CloudSat and geostationary satellite observations. *Journal of Geophysical Research: Atmospheres*, 119(1), 112-121. <https://doi.org/10.1002/2013JD020972>
15. Luo, Z. J., Jeyaratnam, J., Iwasaki, S., **Takahashi, H.**, & Anderson, R. (2014). Convective vertical velocity and cloud internal vertical structure: An A-Train perspective. *Geophysical Research Letters*, 41(2), 723-729. <https://doi.org/10.1002/2013GL058922>

16. **Takahashi, H.**, Su, H., Jiang, J. H., Luo, Z. J., Xie, S. P., & Hafner, J. (2013). Tropical water vapor variations during the 2006–2007 and 2009–2010 El Niños: satellite observation and GFDL AM2. 1 simulation. *Journal of Geophysical Research: Atmospheres*, 118(16), 8910–8920. <https://doi.org/10.1002/jgrd.50684>
17. **Takahashi, H.**, & Luo, Z. (2012). Where is the level of neutral buoyancy for deep convection?. *Geophysical Research Letters*, 39(15). <https://doi.org/10.1029/2012GL052638>

II. CONFERENCE:

Takahashi, H., M., Lebsock, ZJ., Luo, H., Masunaga, and C., Masunaga (2020): Detection and tracking of convective storms based on global gridded precipitation measurements, Geophysical Union (AGU), Fall Meeting, H200-0017

Takahashi, H., M., Lebsock, K., M., Richardson., R., Marchand., J Kay, 2020: When Will Spaceborne Cloud Rader Detect Upward Shifts in Cloud Heights?, CALIPSO/CloudSat Science Review, Boulder CO. March 5, 2020.

Takahashi, H., Yuan Wang, and Kentaroh Suzuki, 2020: The Influence of Aerosols on Warm-Rain Formation Processes based on A-Train Observations and CAM5, American meteorological Society (AMS), 100th Annual Meeting, 12th Symposium on Aerosol – Cloud – Climate Interactions, Poster 1423, Boston, MA, January 15, 2020

Takahashi, H., M., Lebsock, K., M., Richardson., R., Marchand., J Kay, 2019: When Will Spaceborne Cloud Rader Detect Upward Shifts in Cloud Heights?, Geophysical Union (AGU), Fall Meeting, A12E-08

(INVITED) Takahashi, H., Kentaroh Suzuki, Graeme Stephens, and Alejandro Bodas-Salcedo 2018: New Opportunity to Evaluate the Warm Rain Formation Processes in Global Climate Models with A-Train Observations, JpGU, Makuhari, Chiba, Japan, May 22, 2018

Takahashi, H., Z. J. Luo, C. Stubenrauch, and Graeme Stephens, 2018: Deep Convective Outflow, Convective Strength and Anvil Development: New Perspectives Based on CloudSat and CALIPSO, CALIPSO/CloudSat Annual Science Operations Review, Boulder, Colorado, 23-25 April, 2018.

Takahashi, H., Kentaroh Suzuki, and Graeme Stephens 2018: New Opportunity to Evaluate the Warm Rain Formation Processes in Global Models with A-Train Observations, PanGASS meeting, Lorne, Victoria, Australia, Feb 26-March 2, 2018

Takahashi, H., S. Protopapadaki, C. Stubenrauch, Z. J. Luo, and Graeme Stephens, 2017: Relationships between Convective Strength and Anvil Development based on AIRS-CloudSat Joint Dataset, Geophysical Union (AGU), Fall Meeting

Takahashi, H., Z. J. Luo, and Graeme Stephens, 2017: Level of Neutral Buoyancy, Deep Convective Outflow, and Convective Core: New Perspectives Based on the A-Train Observations, Bill Rossow's Retirement Symposium, Colombia University, NY, June 8, 2-17

Takahashi, H., Matthew Lebsock, Kentaroh Suzuki, Graeme Stephens, and Minghuai Wang, 2017: An Investigation of Microphysics and Sub-grid Scale Variability in Warm Rain Clouds using The A-Train Observations and A Multi-Scale Modeling Framework, JpGU-AGU Joint Meeting 2017, AAS08-04

Takahashi, H., Z. J. Luo, and Graeme Stephens, 2017: Level of Neutral Buoyancy, Deep Convective Outflow, and Convective Core: New Perspectives Based on the A-Train Observations, A-Train Symposium 2017, CRH-52

Takahashi, H., S. Protopapadaki, C. Stubenrauch, Z. J. Luo, and Graeme Stephens, 2017: Relationships between Convective Strength and Anvil Development based on AIRS-CloudSat, GEWEX UTCC PROES 2017 meeting, March 28-29

Takahashi, H., Z. J. Luo, and Graeme Stephens, 2016: Level of Neutral Buoyancy, Deep Convective Outflow, and Convective Core: New Perspectives Based on the A-Train Observations, American Geophysical Union (AGU), Fall Meeting, Suppl.

Takahashi, H., Matthew Lebsock, and Kentaroh Suzuki, 2016: An Investigation of Cloud Microphysical Parameters, The Sub-grid Scale Variability, and The Cloud-to-Precipitation Process in Warm Rain Clouds, CALIPSO/CloudSat 2016

Science Team Meeting, March 1-3.

Takahashi, H., Kentaro Suzuki, and Graeme Stephens, 2015: Can Land-Ocean Differences of the Warm Rain Formation Process be Explained by Vertical Velocity?, American Geophysical Union (AGU), Fall Meeting, Suppl., A51M.

Takahashi, H., Kentaro Suzuki, and Graeme Stephens, 2015: Can Land-Ocean Differences of the Warm Rain Formation Process be Explained by Vertical Velocity?, Center for Climate Sciences Research Seminar, October 23

Takahashi, H., Kentaro Suzuki, and Graeme Stephens, 2015: Can Land-Ocean Differences of the Warm Rain Formation Process be Explained by Vertical Velocity?, 2015 Postdoc Research Day, August 18

Takahashi, H., Hui Su, and J. H. Jiang, 2014: Thermodynamic and Dynamic Control of Upper Tropospheric Water Vapor, American Geophysical Union (AGU), Fall Meeting, Suppl., A41A.

Takahashi, H., Hui Su, and J. H. Jiang, 2014: Thermodynamic and Dynamic Control of Upper Tropospheric Water Vapor, EOS Aura Science Team Meeting, September 16.

Takahashi, H., Hui Su, and J. H. Jiang, 2014: Error Analysis of Upper Tropospheric Water Vapor in CMIP5 Model using “A-Train” Satellite Observations and Reanalysis Data. Yuk Yung Lunch Seminar, August 26.

Takahashi, H., Hui Su, and J. H. Jiang, 2014: Error Analysis of Upper Tropospheric Water Vapor in CMIP5 Model using “A-Train” Satellite Observations and Reanalysis Data. City College of New York (CCNY) Seminar, May 2.

Takahashi, H., Hui Su, J. H. Jiang, Z. J. Luo, S.-P. Xie, and J. Hafner, 2013: Tropospheric Water Vapor Anomalies During the 2006-07 and 2009-10 El Niños, American meteorological Society (AMS), 25th Conference on Climate Variability and Change, 25CVS, 590.

Takahashi, H. and Z. Luo, 2012: On the level of neutral buoyancy for deep convection. American Geophysical Union (AGU), Fall Meet., Suppl., A33S-06.

Takahashi, H. and Z. J. Luo, 2011: Tropical overshooting convection: Cloud properties and convective system evolution, EOS Trans. American Geophysical Union (AGU), Fall Meet., Suppl., A23D.

Takahashi, H. and Z. J. Luo, 2010: Tropical overshooting convection from CloudSat and ISCCP, EOS Trans. American Geophysical Union (AGU), Fall Meet., Suppl., A21.

PROFESSIONAL SERVICES/SYNERGISTIC ACTIVITIES:

Organized a Session, AGU Fall Meeting, 2020

- Title: Atmospheric Convection: Processes, Dynamics, and Links to Weather and Climate

Organized a Session, AMS, 100th Annual Meeting, 2020

- Title: 12th Symposium on Aerosol – Cloud – Climate Interactions

Panelist, NASA Panel review, 2019

Organized a Session, AGU Fall Meeting, 2019

- Title: Atmospheric Convection: Processes, Dynamics, and Links to Weather and Climate

Lecture to Amaki Super Science High School, NASA Jet Propulsion Laboratory, November 1, 2019

- Title: Why and How Do We Study Clouds?

Organized a Session, AGU Fall Meeting, 2018

- Title: Convective Clouds: Processes, Dynamics, and Links to Weather and Climate

Lecture to Kanonji Daiichi Super Science High School, NASA Jet Propulsion Laboratory, November 15, 2018

- Title: Why and How Do We Study Clouds?

Organized a Session, AGU Fall Meeting, 2017

- Title: Upper Tropospheric Clouds and Convection: Processes, Dynamics, and Feedbacks in Weather and Climate

Invited Talk, Tokyo University, AORI, Kashiwa, Chiba, Japan, June 1, 2017

- Seminar: Level of Neutral Buoyancy, Deep Convective Outflow, and Convective Core: New Perspectives Based on the A-Train Observations

Invited Talk, RIGC/JAMSTEC, Yokohama, Japan, May 30, 2017

- Seminar: Level of Neutral Buoyancy, Deep Convective Outflow, and Convective Core: New Perspectives Based on the A-Train Observations

NASA Jet Propulsion Laboratory, The Center for Climate Sciences, October 23, 2015

- Presentation: “Can Land-Ocean Differences in the Warm Rain Formation Process be Explained by Vertical Velocity?”

NASA Jet Propulsion Laboratory, Postdoc Poster Award, October 15, 2015

- Presentation: “Can Land-Ocean Differences in the Warm Rain Formation Process be Explained by Vertical Velocity?”

Invited Talk, RIGC/JAMSTEC, Yokohama, Japan, Jan 2011

- Presentation: “Tropical Convection from the A-Train satellite Perspective”

Graduation Research, New York University, Courant Institute, May 2008 – May 2009

- Research on flow and dynamics of the West Antarctic Ice Sheet
- Compute and analyze stick-slip behavior at GPS site

Capstone Project, IUPUI, Jan 2007 – May 2007

- Research on the statistic of dimers on a lattice
- To prove the main result which is an expression of the configuration generating function of the dimer model on the 2D lattice in terms of a Pfaffian

Graduation Research, Chuo University, Apr 2003– Mar 2004

- Research on crystal growth of the ascorbic acid in methanol solution
- Create morphological diagram and analysis of the crystal pattern by temperature and humidity

Youngster's Science Festival, Chiba, Japan, Summer 1999

- Demonstrate how to make snowflakes in the refrigerator and analyze the pattern formations of snowflake

EDITORIAL SERVICES AS A REVIEWER (2013 – Present):

- Journal of Geophysical Research
- Journal of Applied Meteorology and Climatology
- Earth and Space Science
- Geophysical Research Letters
- Journal of Climate
- Journal of the Meteorological Society of Japan
- Atmosphere

FUNDED PROJECTS:

- PI: Using A-Train observations to explore properties of entraining convection and its representation in models, 2020 - 2023
- PI: EarthCARE cloud data record, 2018 - 2020
- PI: CloudSat and A-Train multi-sensor satellite observations to improve representation of aerosol effect on precipitation climate models, 2016 - 2018

MEMBERSHIP:

- AGU
- AMS
- MSJ
- NASA CloduSat/CALIPSO Science Team